IN THE CLAIMS:

1. (Currently amended) A diffusion resistor comprising:

a substrate;

a diffusion region formed in the substrate;

a first contact region extending down from a surface of the substrate;

a second contact region extending down from the surface of the substrate;

a first conductive contact electrically connected to the first contact region such that current can flow between the first contact and the first contact region;

a second conductive contact electrically connected to the second contact region such that current can flow between the second contact and the second contact region; and

a third contact connected to the surface of the substrate <u>and electrically isolated from the first conductive contact and the second conductive contant</u>, wherein the third contact is located between the first conductive contact and the second conductive contact, wherein the third contact forms a Schottky diode ~~such that application of~~ <u>with</u> a voltage <u>being applied</u> to the third contact <u>to form</u> ~~forms~~ a depletion region that changes in size depending on the voltage applied to the third contact to change a resistance in the diffusion resistor, wherein the first conductive contact and the second conductive contact form two ends of the diffusion resistor with no bias voltage on either of the first conductive contact and the second conductive contact.

2. (Original) The diffusion resistor of claim 1, wherein the third contact is connected to the surface by a salicided region.

3. (Original) The diffusion resistor of claim 1, wherein the substrate is a p-type substrate.

4. (Original) The diffusion resistor of claim 1, wherein the substrate is an insulator in a silicon-on-insulator substrate.

5. (Original) The diffusion resistor of claim 3, wherein the first contact region and the second contact region are n+ contact regions.

6. (Previously presented) The diffusion resistor of claim 5, wherein the first conductive contact, the second conductive contact, and the third contact are formed using metal layers.

7. (Original) The diffusion resistor of claim 6, wherein the metals layers are tungsten metal layers.

8. (Original) The diffusion resistor of claim 1, wherein the diffusion region contains n-type dopants having a concentration of about $1 \times 10^{15}/cm^3$.

9. (Original) The diffusion resistor of claim 1, wherein the first contact region and the second contact region contain n-type dopants having a concentration of about $1 \times 10^{18}/cm^3$ to about $1 \times 10^{20}/cm^3$.

10. (Withdrawn) A method for forming a diffusion resistor, the method comprising:

forming a diffusion region in a substrate;

forming a first contact region and a second contact region in the diffusion region, wherein the first contact region and the second contact region extend downward from a surface of the substrate;

forming a first contact on the first contact region and a second contact on a second contact region; and

forming a third contact on the surface of the substrate, wherein the third contact is located between the first contact and the second contact, wherein the third contact forms a Schottky diode such that application of a voltage to the third contact forms a depletion region that changes in size depending on the voltage applied to the third contact to change a resistance in the depletion resistor.

11. (Withdrawn) The method of claim 10, wherein the step of forming the depletion region comprises:

implanting n-type dopants into the substrate.

12. (Withdrawn) The method of claim 11, wherein the n-type dopants implanted into the diffusion region have a concentration of about $1 \times 10^{15}/cm^3$

13. (Withdrawn) The method of claim 11, wherein a doping profile of the n-type dopants is selected to reduce parasitic capacitance.

14. (Withdrawn) The method of claim 11, wherein the step of forming the first contact region and the second contact region comprises:

implanting n-type dopants into the depletion region in a concentration of about $1 \times 10^{18}/cm^3$ to about $1 \times 10^{20}/cm^3$.

15. (Withdrawn) The method of claim 10, wherein the step of forming the first contact and the second contact comprises:

depositing a metal layer onto the first contact region and the second contact region.

16. (Withdrawn) The method of claim 14, wherein the metal layer is a tungsten metal layer.

17. (Withdrawn) The method of claim 10, wherein the substrate is a p-type silicon substrate.

18. (Withdrawn) The method of claim 10, wherein the substrate is an insulator in a silicon-on-insulator substrate.

19. (Withdrawn) The method of claim 10 further comprising:

forming shallow trench isolation regions prior to forming the diffusion region.

20. (Currently amended) The diffusion resistor of Claim 1, in combination with a radio frequency driver circuit having an input and an output, wherein the output is coupled to a transmission line, and wherein the diffusion resistor is coupled between the input and the output of the radio frequency driver circuit to provide a variable resistance feedback path for use in adjusting an impedance of the radio frequency driver circuit to substantially match an impedance of the transmission line, wherein the bias voltage is a DC bias voltage.

21. (New) A method of using the diffusion resistor of Claim 1 as a resistor with no DC bias voltage applied on either of the first conductive contact and the second conductive contact.